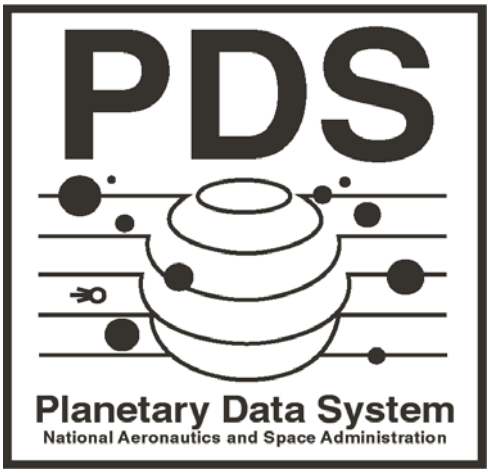
Planetary Data System

Validation Tool (VTool)
Test Procedure

September 12, 2006

Version 0.20060912



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CHANGE LOG

Revision	Date	Description	Author
Start Draft	2006-06-13	First Draft	R. Joyner
Draft Release 1	2006-09-12	Cleaned up document references.	S. Hardman

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1. INTRODUCTION

This document is the Test Procedure for the PDS Validation Tool (VTool).

1.1. Document Purpose

The purpose of this document is to document the test cases / test procedures used to formally verify that VTool functions and performs in accordance with the Level 5 requirements set forth in the Validation Tool (VTool) Requirements Document [1].

1.2. Document Scope

This document addresses the test cases developed during Integration Testing and Beta Testing and used for Acceptance Testing of Version 1.0 of the VTool application. The scope of testing will cover the capabilities which exist and which are defined by the VTool Requirements Document [1]; and referenced in the VTool Test Plan [2].

> Note: For a detailed description of the functions / capabilities present in Version 1.0 of the VTool application, see Section 1.3 of the VTool Test Plan [2].

1.3. Applicable Documents

[1] Validation Tool Requirements, July 25, 2006, Version 1.3.

[2] Validation Tool (VTool) Test Plan (JPL-D xxxx), September 12, 2006, Version 0.20060912.

[3] Planetary Data System Standards Reference, February 1, 2006, Version 3.7, JPL D-7669, Part 2. (http://pds.jpl.nasa.gov/documents/sr/)

[4] Planetary Science Data Dictionary Document, August 28, 2002, Planetary Data System, JPL D-7116, Rev. E. (http://pds.jpl.nasa.gov/documents/psdd/psdd.pdf)

[5] Validation Tool (VTool) Test Report Alpha Test Phase II, September 13, 2006.

2. TEST MANAGEMENT

The management of the test cases and test reports involves creating a directory hierarchy whereby:

(1) the entire suite of tests (e.g., the regression tests) are contained in the directory hierarchy.
(2) the components of each test case are fully self-contained within a branch of the hierarchy.

The diagram below illustrates the directory structure to be used.

```
[root]
  |
  |- [test_reports]
  |      |- VTT_EN_1-1.rpt
  |      |- VTT_EN_1-2.rpt
  |      |- ...
  |
  |- [util]
  |      |- vtool.exe
  |      |- pdsdd.ful
  |
  |- [test_case-1]
  |      |
  |      |- test_case-1.pl
  |      |
  |      |- [baseline]
  |      |    |- test_case-1.rpt
  |      |
  |      |- [config]
  |      |    |- vtool.in
  |      |    |- vtool-dir.txt
  |      |    |- ...
  |      |
  |      |- [target]
  |           |
  |           |- [document]
  |           |    |- doc-1.txt
  |           |    |- doc-2.ps
  |           |    |- ...
  |           |
  |           |- [label]
  |           |    |- partial-1.fmt
  |           |    |- partial-2.fmt
  |           |    |- ...
  |           |
  |           |- [catalog]
  |           |    |- mission.cat
  |           |    |- ...
  |           |
  |           |- [index]
  |           |    |- index.lbl
  |           |    |- index.tab
  |           |    |- ...
  |           |
  |           |- [data]
  |           |    |- xxx.lbl
  |           |    |- xxx.tab
  |           |    |- yyy.lbl
  |           |    |- yyy.tab
  |           |    |- ...
```

```
|           |
|           |- [local-ddict]
|                |- local-1.ful
|                |- ...
|
|- [test_case-2]
|     |
|     |- test_case-2.pl
|     |
|     |- [baseline]
|     |    |- test_case-2.rpt
|     |
|     |- [config]
|     |    |- vtool.in
|     |    |- vtool-dir.txt
|     |    |- ...
|     |
|     |- [target]
|           |
|           |- [document]
|           |    |- doc-1.txt
|           |    |- doc-2.ps
|           |    |- ...
|           |
|           |- [label]
|           |    |- partial-1.fmt
|           |    |- partial-2.fmt
|           |    |- ...
|           |
|           |- [catalog]
|           |    |- mission.cat
|           |    |- ...
|           |
|           |- [index]
|           |    |- index.lbl
|           |    |- index.tab
|           |    |- ...
|           |
|           |- [data]
|           |    |- xxx.lbl
|           |    |- xxx.tab
|           |    |- yyy.lbl
|           |    |- yyy.tab
|           |    |- ...
|           |
|           |- [local-ddict]
|                |- local-2.ful
|                |- ...
|
|- [test_case-3]
|     |
|     |- [...]
```

Figure 3-1. Directory Hierarchy of the VTool Test Suite

With respect to the above figure:

(1) The Test_Reports directory will contain all of the test reports for all of the test cases in the test suite. Each test report will have the name of the Test Scenario ID
(2) The Util directory will contain the VTool application and the planetary science data dictionary files.

(3) Each test_case-n directory will contain all of the files required to execute the test case. There is one directory per test case. Each test case directory will contain the set of subdirectories required to execute the test case.

a. [baseline] – this directory contains the file that is used to evaluate the results of the test case report. (required)
b. [config] – this directory contains the set of files that are passed as parameters to the VTool application. (optional)
c. [target] – this directory contains the set of files that are the target for testing (e.g., data product labels and data product files). (required)
d. [document] – this directory contains the files that are referenced by pointers of type DOCUMENT. (optional)
e. [label] -- this directory contains the files that are referenced by pointers of type STRUCTURE. (optional)
f. [catalog] – this directory contains the files that are referenced by pointers of type CATALOG. (optional)
g. [index] – this directory contains the INDEX files. (optional)
h. [data] – this directory contains the set of data product files. (required)
i. [local-ddict] - this directory contains the local data dictionary files. (optional)

3. TEST CASE DESIGN

The goal in designing the test cases was to have each test case be self-contained and self-documenting with respect to all aspects of running the test and evaluating the success / failure of the test. The approach includes a secondary goal of documenting the test to the extent that the person running the test would require little to no expertise in executing the test cases.

The basic test case design follows:

1. Test Scenario ID
2. Functional Requirement ID
3. Description of the Requirement (from [1])
4. Test Scenario Name
5. Purpose
6. Test Conditions
7. Test Constraints
8. Test Inputs
9. Test Procedure
10. Test Results
11. Change Log

See Appendix A for an example of the template used to document a test case

3.1. Test Scenario ID

Each test case is given a unique identifier, Test Scenario ID. The Test Scenario ID is the primary means for referencing a test case. The Test Scenario ID is derived using the following formation rules:

1. VTT – validation tool test
2. Node identifier:
    a) ATMOS – atmospheres node
    b) EN – engineering node
    c) GEO – geosciences node
    d) IMG – imaging node
    e) NAIF – NAIF node
    f) PPI – plasma interactions node
    g) RINGS – rings node
    h) SBN – small bodies node
    i) RSS – radio sciences node
    j) OTHER

3. Extension – unique identifier

Example:

```
Test Scenario ID: VTT_EN_1-1
```

3.2. Functional Requirement ID

The Functional Requirement ID is the unique identifier given to a requirement and is the primary means for referencing the requirement, as documented in [1]. Each test case is designed to satisfy one or more requirements and those requirements are listed as the Functional Requirement ID.

Example:

```
Functional Req ID: L5.VAL.FR.21
```

3.3. Description of the Requirement

The Description of the Requirement is as documented in [1] and is repeated here solely for the purpose of making the test case self-documenting.

Example:

```
The Tool shall be able to validate one or more PDS data
products as the result of a single tool execution.
```

3.4. Test Scenario Name

The Test Scenario Name is a terse description of the test case and attempts to briefly describe the objective of the test case.

Example:

```
Test Scenario Name
------------------
   Validation of single PDS-3 compliant label
```

3.5. Purpose

The Purpose is a more detailed description of the objective(s) of the test case. A test case can have multiple objectives; each of which will be documented within the Purpose.

Example:

```
Purpose
-------
   (1)  To verify that VTool can validate a single PDS-3 compliant
        label
```

3.6. Test Conditions

The Test Conditions section describes the environment / conditions under which the test case is to be performed.

Example:

```
Test Conditions
---------------
   (1) Test Environment directory path: test_case-1
   (2) Test Report directory path: test_reports
   (3) Test DDICT directory path: util
```

The Test Environment directory path is the equivalent to the logical volume root directory (i.e., the starting point for locating all files to be validated or used in validating the test cases). The Test Report directory path specifies the location of the test case report. The Test DDICT directory path specifies the location of the data dictionary used in validating the test cases.

3.7. Test Constraints

The Test Constraints section lists any constraints that must be addressed prior to executing the test case.

Example:

```
Test Constraints
----------------
   (1) PDS compliant data dictionary / local data dictionaries
```

3.8. Test Procedure

The Test Procedure section describes the actual process used during testing and any constraints that must be addressed prior to executing the test case.

Example:

```
Test Procedure
--------------
   (1) move to the Test Environment directory
   (2) execute the VTool test case script that is located in the
        Test Environment directory
   (3) verify results; in accordance with Test Results section
```

3.9. Test Results

The Test Results section identifies the files and process used in ascertaining the success or failure of the test case.

Example:

```
Test Results
------------
   (1) Report file referenced:
         (a) VTT_EN_1-1.rpt
   (2) Test verification:
         (a) validation report is created in Test Report directory
         (b) verify Summary Report indicates that the validation
              report "matches" the Baseline report found in the
              [Baseline] directory.
```

APPENDIX A EXAMPLE OF A TEST CASE

```
Test Scenario ID: VTT_EN_21-1
 Functional Req ID: L5.VAL.FR.21

      The Tool shall be able to validate one or more PDS data
      products as the result of a single tool execution.
 ------------------------------------------------------------------------

 Test Scenario Name
 ------------------
   Validation of single PDS-3 compliant label


 Purpose
 -------
   (1) To verify that VTool can validate a single PDS-3 compliant label


 Test Conditions
 ---------------
   (1) Test Environment directory path: test_case-1
   (2) Test Report directory path: test_reports
   (3) Test DDICT directory path: util

   See Section 3.6 of the VTool Test Procedures document for a detailed explanation
   of how the above directory paths are used in testing the test cases.


 Test Constraints
 ----------------
   (1) PDS compliant data dictionary / local data dictionaries



  Test Procedure
  --------------
   (1) move to the Test Environment directory
   (2) execute the VTool test case script that is located in the
       Test Environment directory
   (3) verify results in accordance with Test Results section


 Test Results
 ------------
   (1) Report file referenced: VTT_EN_1-1.RPT
   (2) Test verification:  validation report is created in the Test Report directory
   (3) verify Summary Report indicates that the validation report "matches" the
       Baseline Report found in the [Baseline] directory.


 Change log
 ----------
   20060612 - original; integration testing (rsj);
```